Continuing Education – Jan 2015 (rev)

Bougie Assisted Intubation

Diana Neubecker RN BSN PM
EMSS In-Field Coordinator

NOTE: Mandatory CE = any content missed - needs to be made up to receive credit.

Objectives - Agenda

1. Why need bougie-assisted intubation?
2. S/S difficult endotracheal intubation (ETI)
3. Alternatives for airway mgmt
4. Bougie
   a. Effectiveness
   b. Procedure (NWC EMSS)
   c. Videoclips (now or later)
5. Demonstration
6. Practice
7. Return demo w/ skill evaluation

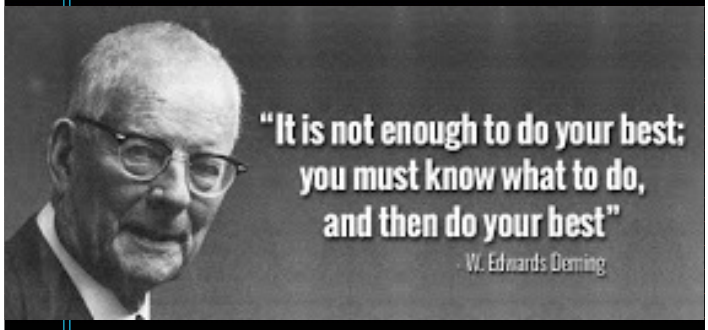
Videos to Watch

A GSAHEMS (3m)
https://www.youtube.com/watch?v=I2XFtIPL4Aw
B Crit-IQ (5m)
https://www.youtube.com/watch?v=iJlwnET5NgY
C Hennepin EM (5m)
https://www.youtube.com/watch?v=H3OC07jan6Y
D Scott Weingart (2m)
https://www.youtube.com/watch?v=E7Lo1JD2Brk
E Morris (1m)
https://www.youtube.com/watch?v=UZoxt7FZZ80
F
G silviu (1m)
https://www.youtube.com/watch?v=u1cMT2nYT_8
H caesarizkha (2m)
https://www.youtube.com/watch?v=8uNbLY43yzg
I Bougie PM Intern (1m)
https://www.youtube.com/watch?v=Ix8i708Cv7g

Why the need for bougie-assisted ETI?

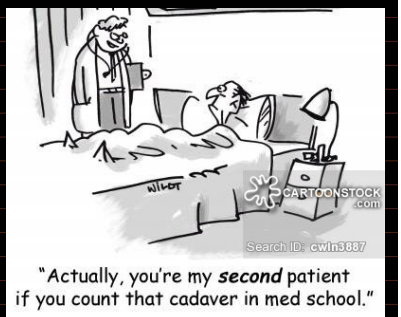
Low ETI Success Rates
+ Difficult Intubations
= Poor Patient Outcome

Why the need for bougie-assisted ETI?



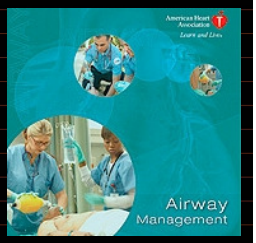
Why Low ETI Success Rates?

- Minimal initial education/practice
- Infrequent skill use
- Difficult conditions (pt & environment)
- Limited resources (drugs, equipment)



ETI Experience

- **NWC EMSS**
  - EMS calls ~62,000/yr
  - PM's ~900
  - ETI = 280/yr (0.45% calls)
- **AHA recommends**
  - ETI x 6/yr (minimum) to maintain skill level
  - 900 PM's x 6 ETI/yr = 5,400 ETI's needed
- **NWC EMSS**
  - 280 ETI's ÷ 6 ETI/yr = skills for 47 PM's (5% of PM's)



ETI Success

Am J Emerg Med. 2014 Nov 20. pii: S0735-6757(14)00834-1. doi: 10.1016/j.ajem.2014.11.020. [Epub ahead of print]

A pilot model for predicting the success of prehospital endotracheal intubation.

Diggs LA[1], Viswakula SD[2], Sheth-Chandra M[3], De Leo G[4].

Author information

Abstract

OBJECTIVES: We sought to evaluate the success of prehospital, non-drug-assisted endotracheal intubation (ETI) performed by Virginia prehospital care providers and to develop a model designed to predict the probability of success of ETI.

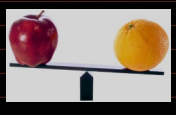
METHODS: We conducted a retrospective observational study on prehospital, non-drug-assisted ETI (N = 4002) performed by Virginia prehospital care providers, from January 1, 2012, to December 31, 2012. Using descriptive statistics, we quantified patient, provider, and system characteristics. Success rates were calculated by provider certification level and number of ETI attempts. Procedure complications were evaluated for the entire cohort. Variables were recoded for modeling purposes. Univariate analyses using χ^2 tests were performed to identify candidate parameters to be included in the model. We performed a backward stepwise logistic regression to predict ETI success.

RESULTS: An overall success rate of 69.9% was found. Binary logistic regression revealed the following covariates associated with ETI success: community type, provider certification level, gender, age group, myocardial infarction, and ethnicity which were all significant ($P < 0.05$) with a -2 log-likelihood value of 3705.574. This was the most parsimonious model evaluated and demonstrated good fit (Hosmer-Lemeshow test P = .646) but poor discrimination (area under the receiver operating characteristic curve = 0.595).

CONCLUSION: This study characterized prehospital ETI success using retrospective state data and found a low overall success rate. Binary logistic regression was performed to create a model and equation identifying a set of factors associated with ETI success.

Premier EMS ETI (99% success rate) How do they do it?

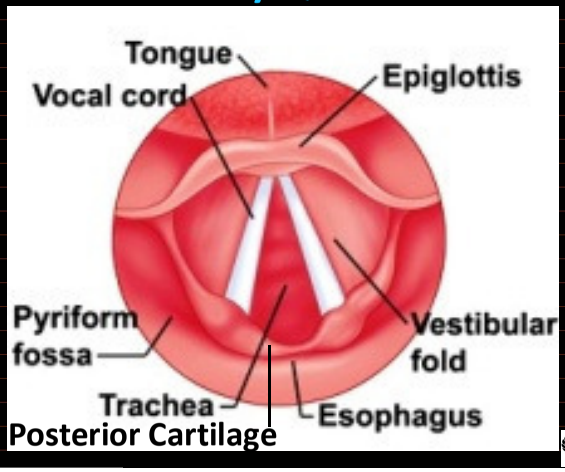
- King County, WA
- 7,523 pts intubated (2006-2011)
- Overall success 99%
- RSI in 54% (1st attempt) w/ paralytics
- Bougie used in 19%



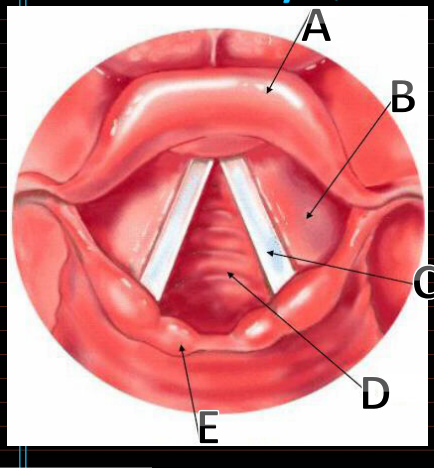
- Seattle EMS
- ~64,000 calls
  - 18,000 ALS/46,000 BLS
  - 74 PM's on 7 ambs
- CE minimum 50 hr/yr
  - >12 ETI/yr required
- PM education
  - >2500 hr / 1 year
  - 16 students/class
  - 36 ETI's / 800 IV's

Future of Advanced Airway???

ETI Anatomy Quick Review



ETI Anatomy Quick Review



A Epiglottis

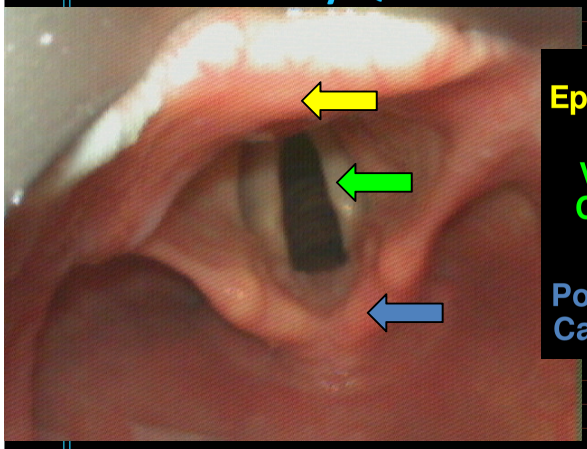
B Vestibular Folds

C Vocal Cords

D Trachea

E Posterior Cartilage

ETI Anatomy Quick Review



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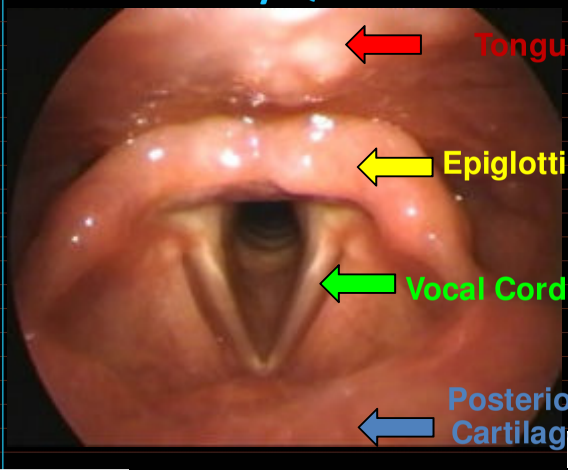

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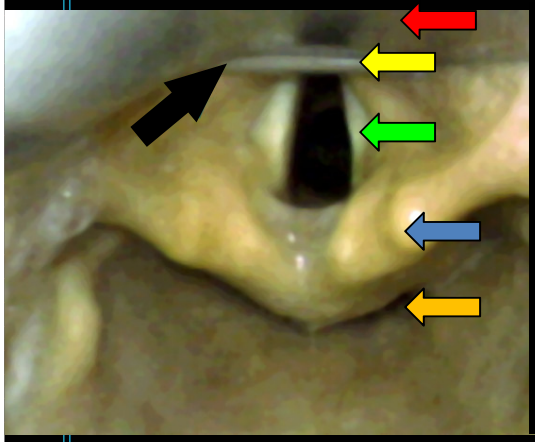

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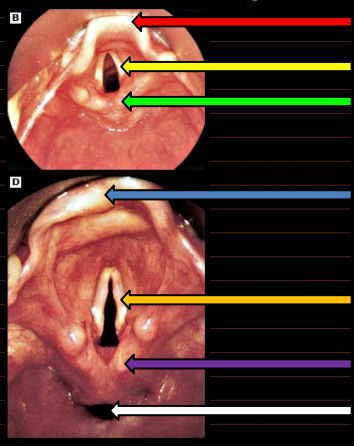

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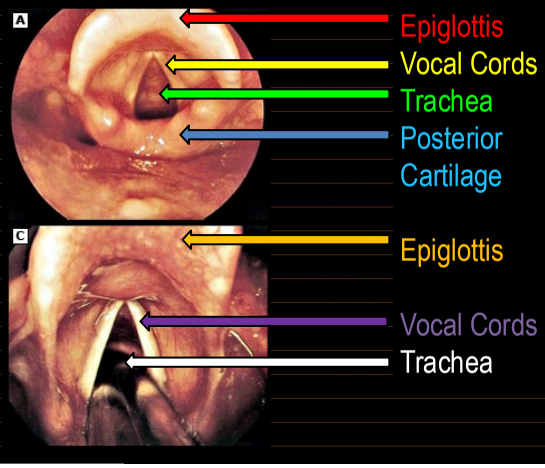
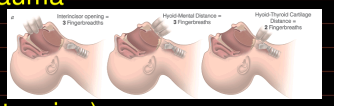
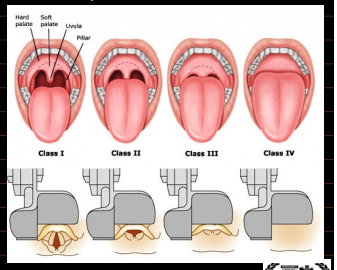


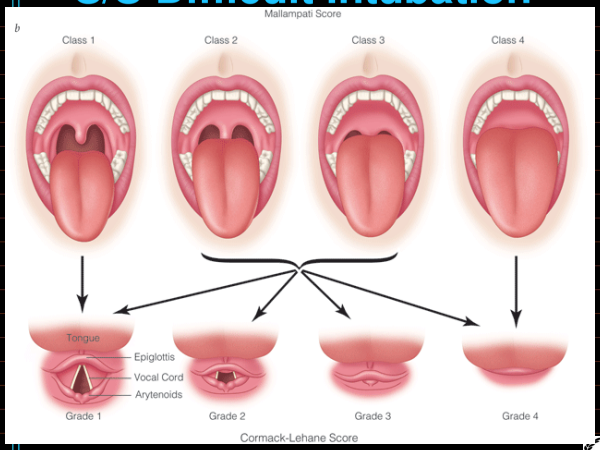
S/S Difficult Intubation ???

- Mass/obesity/swelling/trauma
- Secretions
- Mouth opening
- Neck mobility (flexion/extension)
- Neck length & thickness
- Dental overbite
- Thyromental distance
- Sternomental distance
- Mallampati
- Cormack Lehane

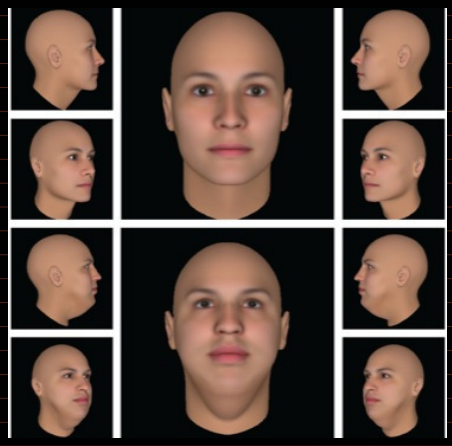




S/S Difficult Intubation

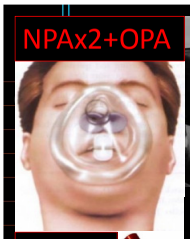


Difficult Intubation ???

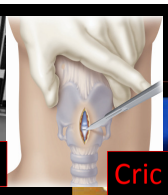


Alternatives

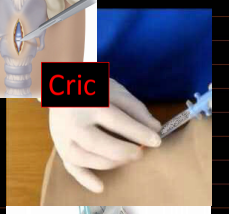
NPAx2+OPA



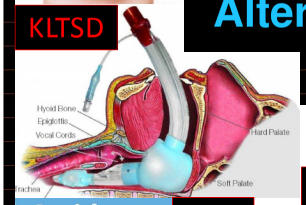
Anterior



Cric

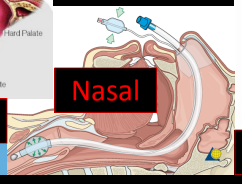


KLTSD

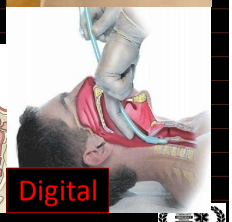


Amidate™
Etomidate Injection, USP
40 mg/20 mL (2 mg/mL)

DAI



Nasal



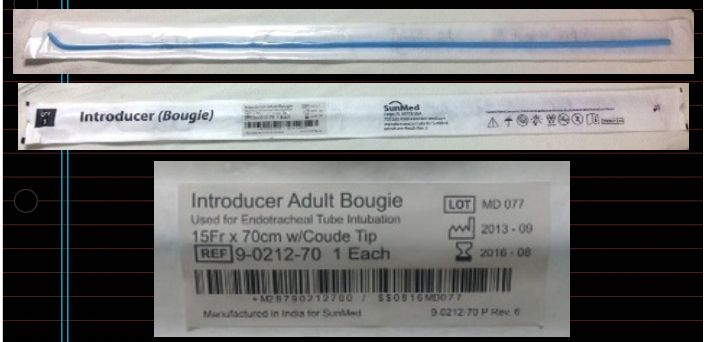
Digital

Not an Alternative

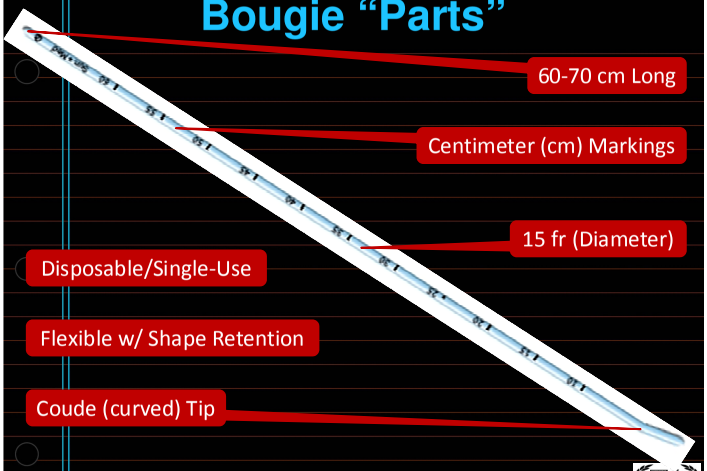
"Nurse, get on the internet, go to SURGERY.COM, scroll down and click on the 'Are you totally lost?' icon."

Bougie-Assisted ETI

Bougie

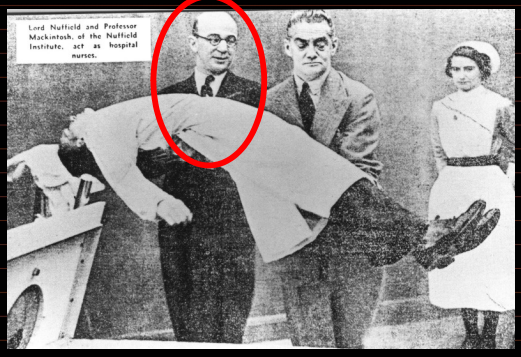


Bougie "Parts"



Bougie

First described in 1949 by Sir Robert Macintosh (1897-1989)
New Zealand born, 1st anaesthesia professor outside the US



Bougie Effectiveness

COMPARISON OF BOUGIE-ASSISTED INTUBATION WITH TRADITIONAL ENDOTRACHEAL INTUBATION IN A SIMULATED DIFFICULT AIRWAY

Matthew J. Mensa, DO, Douglas F. Kaplan, MD, Douglas L. Dunbam, DO

Use of gum elastic bougie for prehospital difficult intubation

Patricia Jabre MD*, Xavier Combes MD**, Bertrand Lapostolle MD*, Emanuelle Adnet MD*, Hervé Auger MD*, Alain Ranquet MD*, Gilles Dhonneur MD*

The bougie as preoperative bleeding airway device.

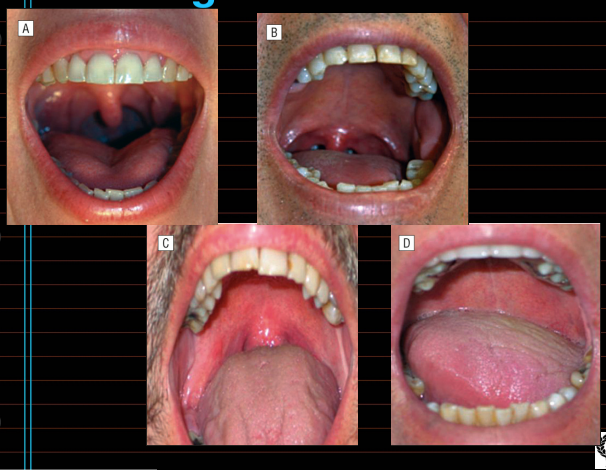
Bougie It!

NWC EMSS Bougie ETI Procedure

- **Indications**
  - Anticipated difficult ETI (may use 1st attempt)
  - 2nd ETI attempt
    - Visualization of either epiglottis or posterior cartilage
- **Contraindications**
  - Inability to visualize either epiglottis or posterior cartilage
- **Caution**
  - Laryngeal or tracheal injury (can exacerbate trauma)

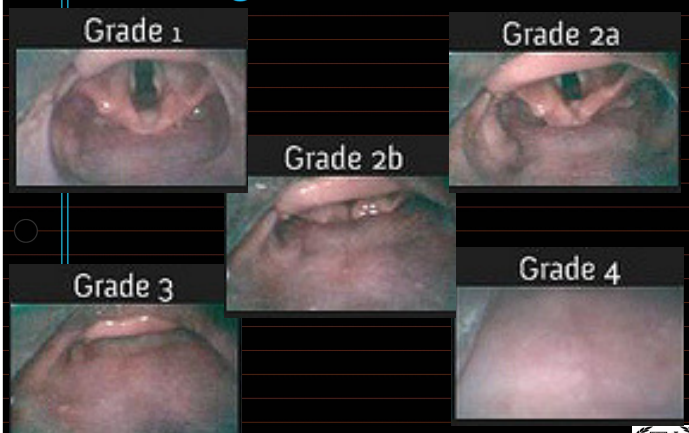
Bougie – Yes or No?

Bougie – Yes or No?



Bougie – Yes or No?

Bougie – Yes or No?



NWC EMSS Bougie ETI Procedure

1. Prepare pt & equipment per standard ETI procedure
2. Remove bougie from package
   a. Note markings & orientation of upturned/coude tip
   b. If needed, straighten bougie and curve distal end (~1" from tip) at 35-40º angle
3. Grip bougie w/ R hand @ 20-30 cm, like a pencil, w/ curved tip facing upward (laryngoscope in L hand)
   - *Caution: Minor rotation of bougie can significantly change orientation and location of tip and prevent placement and confirming clicking sensation (described below)*

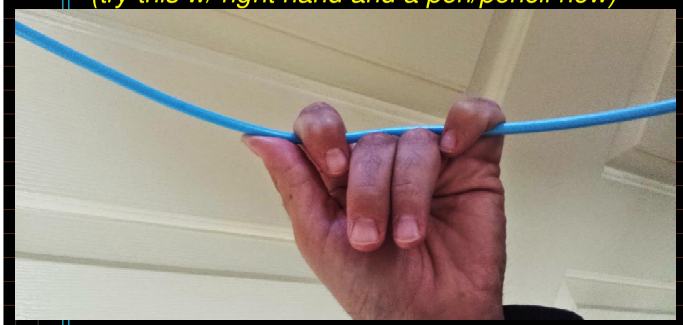
NWC EMSS Bougie ETI Procedure

Grip bougie @ 25-30 cm like pencil w/ curved tip facing upward in R hand (laryngoscope L hand)

NWC EMSS Bougie ETI Procedure

Alternate grip method - prevent rolling between fingers

(try this w/ right hand and a pen/pencil now)



NWC EMSS Bougie ETI Procedure

4. Visualization & Insertion
   a. Insert **GENTLY**; avoid forceful insertion – can cause tracheal trauma/perforation
   b. Epiglottis: insert directed midline under epiglottis
   c. Posterior Cartilage: insert midline above posterior cartilage

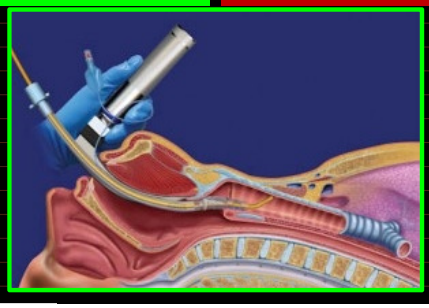
NWC EMSS Bougie ETI Procedure

5. Confirmation
   a. Clicking/vibration sensation felt (60-95% cases) when bougie tip rubs against tracheal rings; note – to be felt, tip must be directed anteriorly
   b. Bougie will stop advancing and resistance ("hold-up") will be felt 25-40 cm at teeth because of distal airway narrowing *(most reliable)*
   c. If inserted into esophagus: no clicking or vibration is felt and tip easily advances well beyond 40 cm

Bougie Location

Trachea
"Hold-Up" @ 20-40 cm
Clicking/vibration sense

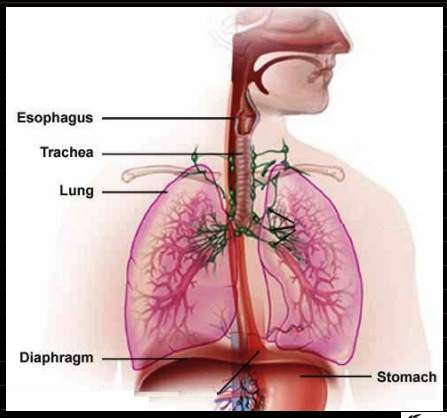
Esophagus
NO "hold-up"
NO clicking/vibration sense



Bougie Location - most reliable method

Trachea
Resistance ("hold-up") felt 20-40 cm @ teeth

Esophagus
NO "hold-up" will advance beyond 40 cm



Bougie Location

Trachea
Clicking/vibration sensation felt (60-95% cases) when bougie tip rubs against tracheal rings; *note – to be felt, tip must be directed anteriorly*

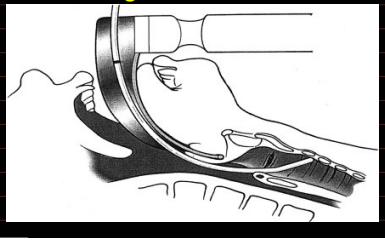
Trachea w/ c-shaped tracheal rings

Esophagus
NO clicking/vibration is felt

Esophagus

NWC EMSS Bougie ETI Procedure

6. Intubator maintains view with laryngoscope and firm hold onto bougie
   a. Maintain bougie ~25 cm @ teeth
   b. Keep laryngoscope in place to allow ETT to pass under tongue



NWC EMSS Bougie ETI Procedure

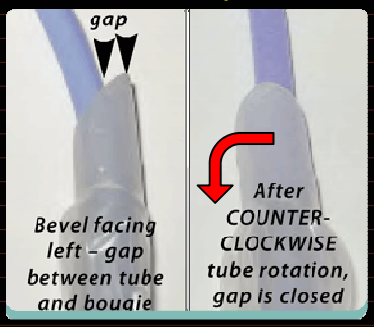
7. Assistant advances ETT (w/ lubricated tip) into proper position
   a. With bougie tip placed in trachea, assistant places ETT over bougie and advances ETT
   b. As ETT reaches intubators fingers, assistant takes over hold on bougie - while intubator continues advancing ETT toward glottic opening
   c. Counter-clockwise rotation of ETT facilitates insertion through vocal cords into larynx

NWC EMSS Bougie ETI Procedure

As ETT reaches intubators fingers, assistant takes over hold on bougie while intubator continues advancing ETT toward glottic opening

NWC EMSS Bougie ETI Procedure

Counter-clockwise rotation of ETT facilitates insertion through vocal cords into larynx



NWC EMSS Bougie ETI Procedure

8. Once ETT cuff passes beyond vocal cords, while firmly holding ETT in place, carefully remove bougie
9. Confirm, secure & reassess per ETI procedure